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A NEW SPECIES OF GALIUM IN CALIFORNIA

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A completely new and radically different species of *Galium* has been discovered by Mrs. Clare Hardham of Paso Robles. Mrs. Hardham, who has been making a study of the flora of the Santa Lucia Mountains, has found the new *Galium* in six separate localities, almost invariably associated with *Cupressus sargentii* Jepson, which is a well-known indicator of serpentine soils. The new species is diploid ($2n = 22$), highly uniform, and almost certainly primitive and residual.

Its nearest relative would seem to be *Galium clementis* Eastwood, which is another endemic occurring a little farther north on Cone and Junipero Serra (Santa Lucia) peaks. More distantly, the new species is certainly related to *G. californicum* H. & A., *G. nuttallii* Gray, *G. bolanderi* Gray, *G. sparsiflorum* Wight, etc., all of which it resembles in its dioecism and in the possession of fleshy fruits. It differs sharply from all of those species, however, in having six leaves to a node instead of four. *Galium clementis* has generally four leaves to a node, but occasionally six, and stands uniquely, therefore, in an intermediate position between the new species, described herein as *G. hardhamae*, and all of our other berry-fruited species. *Galium hardhamae* differs additionally from *G. clementis* in having a less compact habit, fewer shorter hairs (being consequently of a much darker green), slightly smaller leaves and flowers, and in the succulence of its leaves.

Galium hardhamae is a dioecious perennial growing usually under or near *Cupressus sargentii*, on humous serpentine soil. The plants are low and matted, rooting at the nodes, the flowering branches ascending or weakly clambering, the hispid internodes $\frac{1}{2}$ to $2\frac{1}{2}$ cm. long, mostly much longer than the leaves. The leaves (invariably 6 to a node) are bright green, sparsely hispid, lanceolate, acute, and each tipped with a stout hair. When living, they are fleshy, round above and plane beneath. In the

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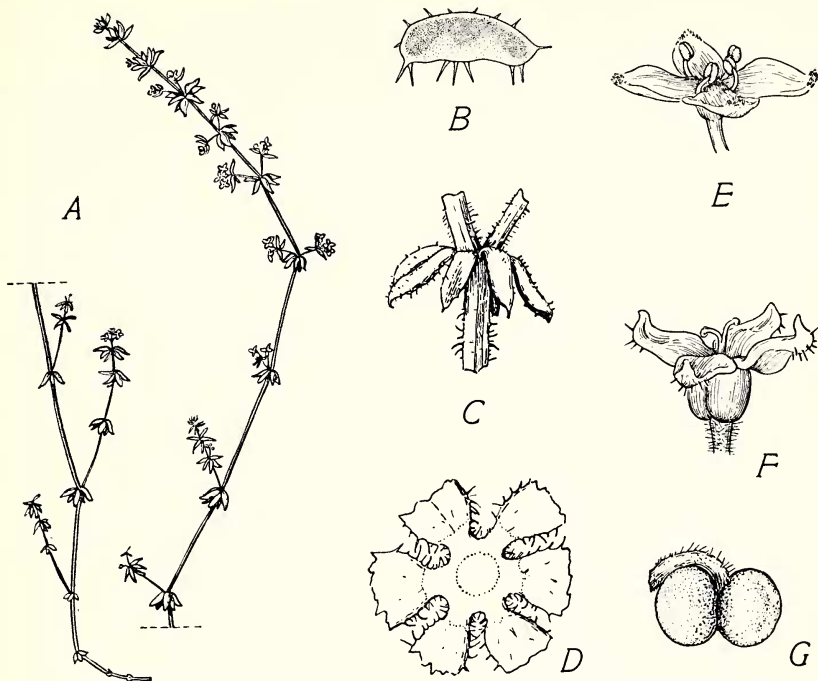


FIG. 1. A, single flowering branch (staminate) $\times \frac{3}{4}$; B, cross section of leaf blade, $\times 15$; C, single node with leaves, $\times 2\frac{1}{2}$; D, leaf bases of a single whorl, $\times 15$; E, staminate flower, $\times 10$; F, pistillate flower, $\times 10$; G, nearly ripe fruit, $\times 2\frac{1}{2}$. The difference in the hairs of the two flowers illustrated is not a sexual, but an individual difference.

desiccated condition, however, they curl downward laterally, owing to shrinkage of the spongy parenchyma. Apart from this lateral curling, the leaves are more reflexed or less, depending upon the condition of moisture, being sharply turned back when dried naturally, and spreading horizontally when wet. This activity is apparently a function of the colorless petioles, the green leaf-blades being quite rigid because of their succulence. The inflorescence is long and slender, the branchlets being mostly less than 1 cm. long. The corollas are rotate, about 2 mm. across, yellow or green, sparsely hispid externally. The ovaries are glabrous or nearly so, and the fruit is a didymous berry, or sometimes it is globose because of the abortion of one seed. Fully ripe and dehydrated fruits are black and wrinkled.

Galium hardhamae Dempster, sp. nov. Herba dioica perennis, ramis decumbentibus vel rare scandentibus. Caules hispidi, internodiis longis cm. $\frac{1}{2}$ – $2\frac{1}{2}$, quam foliis saepe multo longioribus. Folia sena plus minusve reflexa, mm. 2–4 longa, ovata, acuta, ambis paginis hispida, in vita planoconvexa, in herbario deorsum lateraliter volvata. Inflorescentia longa

angustaque, ramis brevibus plus minusve 1 mm. Corollae rotatae, diametro circa mm. 2, flavae vel virides, extra sparse hispidae. Ovaria glabra. Fructus carnosus didymi vel saepe orbiculares, laeves.

Type. Seaward slope of Santa Lucia Mountains in grove of Sargent Cypress, south ultimate fork of Alder Creek, southwestern Monterey County, California, at 2200–2500 feet, *Clare Hardham 5650* (JEPS).

Other collections. Monterey County: upper reaches of Alder Creek, *Dempster & Hardham 1406* (JEPS); Villa Creek south of Lion Den Spring, *Hardham 6065*. San Luis Obispo County: Waterdog Creek, *Hardham 6380* (JEPS); Cypress Swamp just northeast of Cypress Mountain, *Hardham & Dempster 5703* (JEPS), *Hardham 3962* (JEPS); Spanish Cabin Creek, *Hardham 5963*; Tobacco Creek, *Hardham 5967*; headwaters of Chris Flood Creek (San Carpofo), *Hardman 6145*. Numbers otherwise undesignated are in the private collection of Mrs. Hardham at Paso Robles, California.

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A NEW SPECIES OF CRYPTANTHA (SECTION
CIRCUMSCISSAE) FROM CALIFORNIA AND TWO
RECOMBINATIONS (SECTION CIRCUMSCISSAE AND
SECTION ANGUSTIFOLIAE)¹

KUNJAMMA MATHEW AND PETER H. RAVEN

Cryptantha circumscissa (H. & A.) I. Johnston is an annual herb that occurs over a wide area of western North America, from Wyoming and central Washington to Arizona and northern Baja California. In one population, supposed to be referable to this species and located north of Adelanto on the Mojave Desert of San Bernardino County, California, three distinct entities were found, differing modally from one another in corolla size. The largest-flowered group of plants had corollas 4–6 mm. in diameter and pollen grains 5.5–6.5 μ long. These measurements are beyond the range of variation characteristic of *C. circumscissa*. With further exploration it was found that plants with such measurements comprised a distinctive series of populations from a limited area in southern California, and they are described below as a new species.

Cryptantha similis Mathew & Raven, sp. nov. Herba annua sectionis *Circumscissae*, a *C. circumscissa* persimilis, at differt: corolla 4–6 mm. lato; granis pollinis 5.5–6.5 μ longo.

Slender or bushy, bristly-pubescent annual herb, cymosely branched from the base, with ascending branches to 10 cm. long; leaves linear to narrowly oblanceolate, 3–10 mm. long, inconspicuously pustulate, with

¹ Thanks are due Professor Harlan Lewis for pointing out the variation pattern leading to this study and for a critical review of this manuscript, and to the curators of the following herbaria for permission to examine material in their care: British Museum (Natural History), California Academy of Sciences, University of California (Berkeley), Dudley Herbarium (Stanford University), Pomona College, Rancho Santa Ana Botanic Garden, and Royal Botanic Gardens (Kew).